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Socially Responsible Investing and Management Style of Mutual Funds in the Euronext Stock Markets

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SOM - theme E

Financial Markets and Institutions

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Abstract: This paper analyses fund management styles on the Euronext stock exchanges. Especially, we investigate how social responsibility is accounted for. We use style analysis to assess fund performance in Belgium, France, and the Netherlands for over 800 investment funds during the 1990s. We find remarkable and significant differences in performance characteristics among these markets. Furthermore, we find that funds that to some extent mirror well known social responsibility indices tend to perform better than funds that bear no relationship with social responsible investment strategies.

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SOCIALLY RESPONSIBLE INVESTING AND MANAGEMENT STYLE OF MUTUAL FUNDS IN THE EURONEXT STOCK MARKETS

I. INTRODUCTION

The preferences of society, as revealed by regulations and market choices, inevitably affect corporate financial performance, if only indirectly. Likewise, most decisions by a firm have at least some impact on its financial condition. The idea that social responsible behavior of a firm might have a significant - in other words, material - effect on financial performance, however, is not widely accepted yet. However, a fast growing number of mutual funds use screens to select or to omit firms on the basis of them undertaking particular activities with basically social, non-economic, characteristics. Examples are funds that exclude firms involved in the production and/or distribution of tobacco, alcoholics, and weapons. Gambling, animal testing, labor relations, human rights, environmental issues, and community relations also are used as negative or positive screens. In late 1999, more than 12 per cent of all investment in the US was socially screened in one way or another (see www.socialinvest.org). Socially Responsible Investing (SRI) is the integration of personal values and societal concerns with investment decisions. SRI considers both the investor's financial needs and an investment's impact on

society. Putting up positive or negative screens with respect to fund selection effects SRI. An important issue in this respect is whether the social responsible investor foregoes returns from using socially responsible screens. The basic idea behind such reasoning is that by putting up screens, the universe of investment objects is reduced. As such, you might not be able to construct an optimal portfolio. However, there is some evidence that the actual financial cost of SRI in terms of opportunity costs is not substantial. For example, Guerard (1997) concludes that there was no statistically significant difference between the performance of a screened universe of 950 common stocks and an unscreened universe of 1,300 stocks for the period 1987-1996. D'Antonio et al. (1997) study the returns of bonds from firms represented in the Domini 400 (an index for SRI) and compare these with the return of the Lehman Brothers Corporate Bond Index. They find no significant differences in average portfolio performance. Diltz (1995) concludes that there is no statistically significant difference in returns for 14 socially screened stock portfolios versus 14 unscreened stock portfolios generated from a universe of 159 securities during the 1989-1991 period. Given the outcomes of these studies, the conclusion seems justified that the returns of socially responsible investment portfolio are not much different from those of comparable investments.

In this study, we investigate to what extent mutual funds are involved in socially responsible investing. In particular, we are interested in the current social responsible investment behavior of *all* mutual funds, not only in that of those funds

that have stated objectives claiming that they select social responsible investments. Do funds perform as if their investments are made on a social responsible basis? Furthermore, we analyze whether there are significant differences between financial markets in this respect. We limit our study to mutual funds that concentrate on equity investments. The main motivation for this restriction is that our SRI-indices are equity based. So far, it is the huge US market that gets most attention in the literature. In contrast, our focus is on Europe. In particular, we investigate the three markets that make up "Euronext", i.e. the stock markets of Amsterdam, Brussels, and Paris. We opt for these three markets because of data availability and because we wondered about their homogeneity with respect to SRI investment. We analyze a recent period, namely 1994-1999. As far as we are aware, no previous quantitative research on European SRI has appeared in academic journals.

We use style analysis to assess fund performance with respect to SRI. Style analysis is a procedure for measuring exposures to variations in returns of major asset classes (Sharpe, 1992). Note that style analysis fundamentally differs from the studies mentioned before. These studies take SRI into account by dividing the sample into a group of portfolio managers or stocks that are engaged in SRI and a group that is not. This can be very misleading, as this classification is based on the stated objectives of fund managers. In particular, Kim et al. (2000) show that the stated fund objectives differ from the actual fund behavior in 50% of the cases. In addition, by using style analysis, it is possible to measure the extent (if any) to

which value has been added through active management in comparison with a benchmark that reflects the degree of SRI of the actual portfolio.

The structure of this paper is as follows. In section 2, we explain the methodology used. Section 3 introduces our dataset. The results are in presented in section 4. Our conclusion is in section 5.

II. METHODOLOGY

In this study, we use the style analysis methodology as proposed by William F. Sharpe (1992). Style analysis is a specific form of the multi-factor model in which each factor represents the return on an asset class, and where the factor sensitivities add up to 1. The factors are usually derived from market indices representing the returns of asset classes such as bond market investments, value stocks, growth stocks, etc. The factors are used to explain the return of a mutual fund or any other investment portfolio. The regression coefficients are interpreted as the exposure of an investor's portfolio to the returns of the market indices.

Style analysis offers the opportunity to determine the exposure of a portfolio with respect to economic factors represented by market indices as well as to determine the extent to which value has been added through active fund management. With style analysis, the portfolio returns are explained by so-called style indices. Style indices are factors that represent the return of investment strategies based on

specific selection criteria. Style analysis is different from classic econometric techniques such as factor analysis as it allows for the introduction of constraints on the strategy necessary for constructing portfolios that replicate the factors. In particular, we consider it useful to add constraints on the sign of the factors. As a result, the estimates of the exposure of a portfolio with respect to specific market indices can be more realistic. The objective of our study is to measure the extent of socially responsible investing and therefore we included an index of socially responsible investing.

In our model, the return of mutual fund i in month t is explained by:

$$R_{i,t} - r_{f,t} = \alpha_i + \sum_j^J b_{ij} (r_{j,t} - r_{f,t}) + e_{i,t}, \quad (1)$$

subject to:

$$\begin{aligned} b_{ij} &\geq 0 \\ \sum b_{ij} &= 1. \end{aligned}$$

Here, $r_{j,t}$ represents the return of style index j during month t , b_{ij} represents the sensitivity of the mutual fund's i return to the return of index j , $r_{f,t}$ is the return on the risk-free investment, and α_i is a constant. Furthermore, $e_{i,t}$ is the non-factor return for asset i in month t . It is assumed that the residual $e_{i,t}$ is uncorrelated with the return of any of the factors and that the residuals do not exhibit serial correlation. The aim is to choose the factors in such a way that the only common source of correlation between individual funds is due to the style indices.

The return in month t attributable to style is equal to:

$$\sum_j^J b_{ij}(r_{j,t} - r_{f,t}),$$

and the return in month t attributable to individual properties of the fund is equal to:

$$\alpha_i + e_{i,t}.$$

The objective of style analysis is to separate the return due to common sources from the return due to individual sources.

Traditionally, style analysis is used to classify the investment strategy of a portfolio manager based on criteria such as dividend yield, geographical region, or the size of the fund. The classification is based on the construction of indices, where each asset has a unique classification. The classification based on dividend yield results in value stocks with high dividend yields and growth stocks with low dividend yields. The classification according to market capitalization results in large capitalized stocks and small capitalized stocks. Often, style analysis is based on a classification over two dimensions. For example, Indro et al. (1998), Arshanapalli et al. (1998), and Buetow et al. (2000) measure style according to dividend yield and market capitalization. Of course, the usefulness of the asset class factor model depends on the asset classes chosen. In this paper, we choose social responsible investment as the relevant criterion to classify stocks. This

choice is warranted by the fact that SRI conceptually clearly differs from non-SRI and because it is used as an attribute in fund marketing too.

Thus, style analysis assumes that the returns are attributable to style indices that represent the return on asset classes. In the next section, we will describe our data. Section 4 goes into the style analysis.

III. Data

The data on mutual funds was obtained from the Standard & Poor's Micropal database on European mutual funds. From this database we derived information on the monthly returns of mutual funds in Belgium, France, and the Netherlands from January 1994 until July 1999. For each fund, we obtained 66 monthly observations of total rate of return.

Table 1: Sample of mutual funds

		Number of funds in the database	Number of funds with equity	Mean return *	Cross-sectional standard deviation in average returns of individual funds	Mean of standard deviation of returns of individual funds
Belgium		759	110	1.00%	0.34%	4.74%
France	<i>SICAV</i>	940	255	0.87%	0.50%	4.82%
	<i>FCP</i>	2,292	339	0.68%	0.54%	4.88%
Netherlands		447	80	0.99%	0.55%	5.47%
All Funds		4,438	784	0.81%	0.53%	4.90%

* Statistics are calculated based on the monthly observations of returns over the period January 1994 to June 1999 measured in terms of Euro returns using a synthetic Euro rate until 31/12/1998 and real Euro rates starting from 1/1/1999.

Table 1 gives the key characteristics of the funds. From the 4,438 funds in the database, we selected only those funds that have as a stated objective that they invest in equity. As such, we are left with 784 mutual funds with a return history starting from January 1994 up to July 1999. The returns and the standard deviations in these returns are given in table 1 too. The average monthly returns are highest in Belgium and lowest in France. The volatility in the returns is highest in the Netherlands. Note that in France two general types of mutual funds exist: SICAVs and FCPs. This is a juridical distinction. SICAV stands for "Société d'Investissement à Capital Variable", meaning that it is an investment company with variable share capital. A mutual fund that has a SICAV structure has its own

set of articles of incorporation and its own Board of Directors. Each share in the SICAV entitles the shareholder to a voting right at any shareholders meeting of the SICAV. FCP stands for "Fonds Commun de Placement". An FCP is not an independent legal entity. It has to be managed by a management company. The unit holders have no vote and therefore cannot take control of the company. The decisions lie with the board and the shareholders of the management company.

The model we use has six asset classes. Please note that this implies that six factors are to be held responsible for the returns in our style analysis. The return of each factor is represented by a (market capitalization weighted) index of the returns on a large number of securities. We consider the following set of explanatory variables (indices):

- | | |
|----------------------------------|---|
| 1. Bonds: | Salomon Brothers World Government Bond Index (WGBI) |
| 2. Stocks, Pacific: | MSCI Pacific |
| 3. Stocks, Europe: | MSCI Europe |
| 4. Stocks, US: | MSCI North America |
| 5. Sustainable Stocks, Europe: | DJSGI Europe |
| 6. Sustainable Stocks, Americas: | DJSGI Americas |

Although our dataset consists of mutual funds investing in equities, it is still possible that some of the funds to some extent invest in bonds, or money market instruments. This could be a meaningful tactic for a fund manager who wants to engage in market timing. Portfolio managers could also create synthetic positions

in bonds by using derivative instruments such as futures and options. Therefore, we introduce the Salomon Brothers WGBI index in our model to control for any economic exposure to money market investments or bonds. The second, third, and fourth indices are MSCI equity indices for the regions Asia, Europe, and America. These indices serve as proxies for non-SRI investments, although some of the funds represented in the MSCI indices also may be classified as SRI. It would have been preferable if the indices in our model resulted in a mutual exclusive classification over SRI and non-SRI stocks. However, such indices are not available yet. The fifth and the sixth indices may require a short explanation. These are indices put together by a joint venture of the Dow Jones Indexes and the SAM Sustainability Group. They selected the leading companies in 68 industries with respect to sustainability. Sustainability was analyzed on the basis of 229 attributes ranging from corporate governance to child labor and from risk control to remuneration. We use sustainability as a proxy for SRI. Firms within the DJSI indices are subject to ongoing review. We selected two of their regional indices that match MSCI indices. The countries included in the DJSI indices are equal to those included in the MSCI indices. The only exception is Greece, which is included in the DJSI index for Europe but not in the MSCI index for Europe (this concerns three listings).

Table 2 gives the mean and the standard deviation for the monthly returns of the indices to be used in the style analysis for January 1994 to June 1999. Recall that these six indices are to be regarded as the explaining factors in our model. In the

period under review, the average returns are highest in America and lowest in the Pacific region. The Pacific witnesses most volatility.

Table 2: Databases with index data

	Mean	Standard deviation
Salomon Brothers WGBI	0.02%	3.73%
MSCI Pacific	-0.43%	6.19%
MSCI Europe	0.72%	4.41%
MSCI North America	1.25%	4.12%
Dow Jones Sustainable Growth Index Europe	0.78%	4.72%
Dow Jones Sustainable Growth Index Americas	1.62%	4.82%

The cross-correlation among the monthly returns of our indices is given in table 3. These data reveal that there is substantial correlation. Especially, the correlation coefficient between the MSCI Europe and the DJSG Europe is high. The correlation between the MSCI North America and the DJSG America is only somewhat lower. Note that the cross-correlation between the sustainable indices of Europe and America is lower than that of the general market indices of these two regions. A comparison of the DJSG indices with their MSCI counterparts shows that there are differences between the return distributions in terms of means and standard deviations. However, using a t-test on the equality of the means, we did

not find significant differences¹. A study of the quantile-quantile plots also showed that the return distributions of the sustainable indices and their MSCI counterparts are similar². This is consistent with the studies of Diltz (1995), D'Antonio et al. (1997), and Guerard (1997).

Table 3: Correlations

	Salomon Brothers	MSCI Pacific	MSCI Europe	MSCI North America	DJSG Europe	DJSG America
Salomon Brothers	1					
MSCI Pacific	0.4253	1				
MSCI Europe	0.5468	0.6121	1			
MSCI North America	0.4453	0.6025	0.7555	1		
DJSG Europe	0.5380	0.6037	0.9797	0.7441	1	
DJSG America	0.3621	0.5583	0.7075	0.9383	0.6900	1

¹ To check whether the DJSG return distributions are equal to their MSCI counterparts, we performed a Kolmogorov-Smirnoff goodness-of-fit test. This shows that both distributions are equal.

² The quantile-quantile plots are presented in appendix B.

IV. RESULTS

The summary statistics in section 3 suggest that there are substantial cross sectional differences in the returns among the different regions. In this section, we analyze whether the differences in the characteristics between SRI returns and non-SRI returns also translate in portfolio differences. In this respect, style analysis provides a tool to study mimicking portfolios. A potential problem in our study is the high correlation between the DJSG indices and the corresponding MSCI indices. This implies that the estimated coefficients for individual models can be very unstable. Therefore, we aggregate the outcomes on the level of countries and restrict our conclusions to a comparison between countries.

Table 4 gives the general average scores of our style analysis for all 784 funds as well as for the three markets that make up Euronext. As such, it shows the (mimicked) relative importance of screened funds in the respective portfolios.

Table 4 reveals that the average exposure to the DJSG indices combined is approximately almost 5% of the portfolio size. SRI apparently is mostly an issue in the Netherlands where the average score on sustainability is almost one fifth of the total portfolio. In Belgium, it is about 7%. With the mutual funds in France, we have clearly much smaller weights. For the SICAVs, it is slightly above 3 percent, for the FCPs, it is just below 2%.

In table 4, we present the average R^2 for the entire sample and for each of the subsamples³. The average R^2 of the individual model is rather low.

Table 4: Average scores for sample and for subsets

	Bonds	Pacific	Europe	US	Sustain- able Europe	Sustain- able America	average R^2
All Funds	28.00%	10.23%	49.35%	7.50%	3.56%	1.36%	73.3%
Belgium	27.00%	8.83%	46.98%	10.17%	4.86%	2.17%	80.3%
France SICAV	38.06%	7.46%	46.68%	4.54%	2.21%	1.05%	73.9%
France FCP	17.44%	10.92%	61.01%	8.65%	1.37%	0.61%	70.6%
Netherlands	20.38%	21.66%	26.79%	12.72%	14.47%	3.99%	72.6%

For all three markets, we would like to know whether the differences in table 4 are statistically significant. Therefore, in table 5, we present the results of a test on the equality of the averages of the cross-sectional exposure to the DJSG indices in the constrained regression. We used a t-test on the equality of sample means with different variances. This table shows that the average exposure to the DJSG Europe index of Dutch mutual funds is significantly larger than the average exposure of Belgian and French mutual funds. Furthermore, table 5 reveals that the

³ In an OLS model with constrained estimators, R^2 can be calculated in two ways resulting in different answers. R^2 can be calculated as one minus the ratio of residual variance to the variance of the fund's return, which yields answers in the interval $[-\infty, 1]$, or R^2 can be calculated as the ratio of systematic variance to total variance, which yields answers in the interval $[0, \infty]$. We choose to calculate R^2 according to the first definition, as this generally results in lower outcomes and still fits the idea that an outcome of 1 implies a perfect fit.

average exposure of Belgian mutual funds is significantly larger than the average exposure of French mutual funds. The average exposure of the Dutch funds to the DJSG America index is significantly larger than the average exposure of the French funds, and also the Belgian funds have a significantly larger average exposure than the French funds. In general, the differences between the average exposures to the DJSG America index are less significant than those with the DJSG Europe index. Also, the differences between France FCP and France SICAV are not statistically significant on reasonable confidence levels.

Table 5: T-value for test on the difference of the mean exposure to DJSG indices

	Europe	US
Belgium – France FCP	2.21**	1.72*
Belgium – France SICAV	2.95***	2.59**
Belgium – Netherlands	-4.63***	-1.39
France FCP – France SICAV	1.32	1.35
France FCP – Netherlands	-6.74***	-2.43**
France SICAV – Netherlands	7.24***	2.85***

*** Denotes a confidence level of 99%

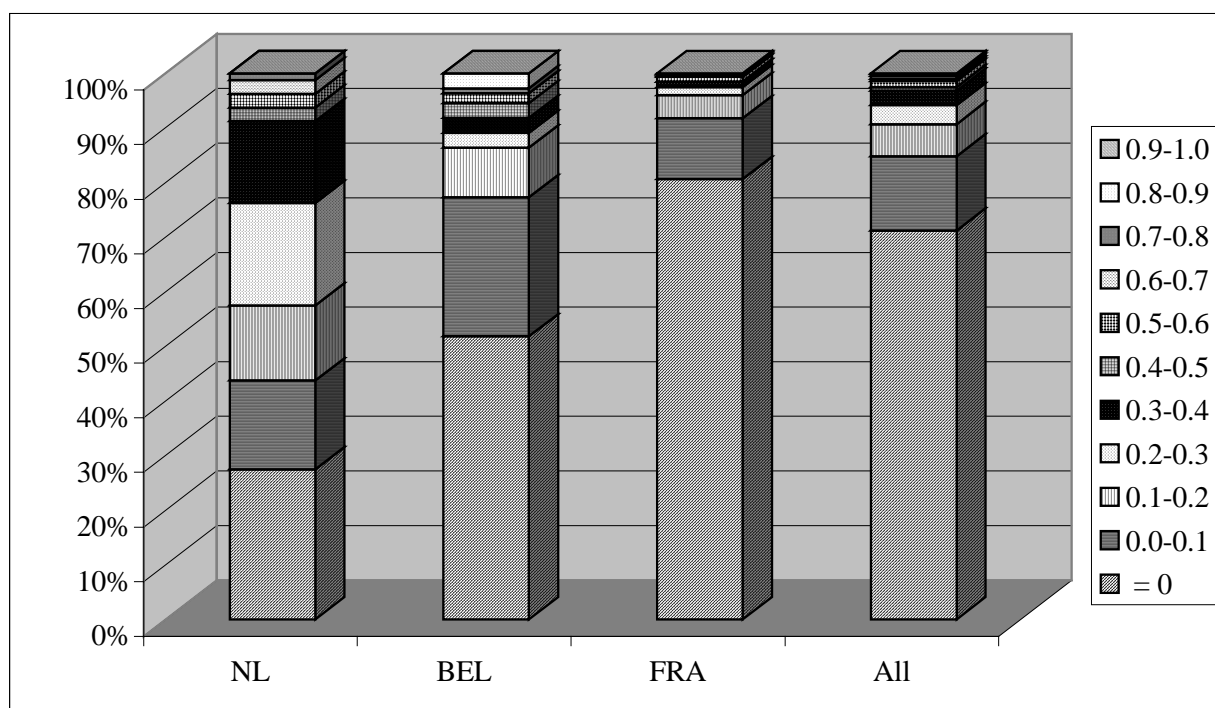
** Denotes a confidence level of 95%

* Denotes a confidence level of 90%

To analyze how SRI is embedded in the different financial markets, we investigate the different classes. As such, figure I gives the relative distribution of the SRI weights (US and Europe combined) among all funds as well among the three

countries (as there are only minor differences between SICAVs and FCPs in France in this respect, these two are combined). The histogram clearly illustrates the differences between the three countries as to the exposure to SRI. For example, in the Netherlands, the relative size of the SRI style is more than 30% of the total portfolio for more than one third of all funds, whereas in Belgium, this is less than 10% and in France it is only 2.5%. Also, 80 per cent of all mutual funds in France has a zero SRI weight. In Belgium, this is 52 per cent, and in the Netherlands it is 27 per cent.

Figure I: SRI weights in mutual funds' portfolios (% DJSGI Europe and America combined)



We also can test for the differences in the relative importance of SRI among the financial markets that is shown in figure I. To this extent, table 6 yields the percentage of the funds that have positive coefficients for SRI based on a constrained regression. This percentage corresponds to the sum of the 10 boxes with positive values in figure I. On the level of individual funds, it is not straightforward to determine the significance of the coefficients.

Table 6: Percentage of funds with positive coefficients for sustainable indices in constrained regression

	Europe	US
All funds	19.5%	13.6%
Belgium	29.1%	24.5%
France SICAV	18.4%	11.0%
France FCP	7.1%	7.1%
Netherlands	62.5%	35.0%

Using the unconstrained model, the significance of the coefficients can be established more easily. In appendix A, the percentage of the funds with significant positive DJSG coefficients is presented. Not surprisingly, these percentages are lower than the ones in table 6. However, the same general picture emerges when we compare the SRI styles in the three countries: the highest scores (i.e. most in the direction of SRI) can be found in the Netherlands, Belgium takes an intermediate position, and the lowest scores can be found in France. Thus the

results of the unconstrained regressions confirm the outcomes of the constrained regressions.

The performance characteristics for funds with an exposure to one or both of the DJSG indices as well as for funds without an exposure to these indices is presented in table 7.

Table 7: Performance summary conditional on DJSG exposure

	exposure to DJSG indices	average excess return	alpha	average style premium	average standard deviation
All funds	positive	0.32%	-0.20%	0.52%	4.90%
	none	0.30%	-0.23%	0.53%	4.73%
Belgium	positive	0.69%	0.13%	0.56%	4.63%
	none	0.36%	-0.10%	0.46%	5.31%
France SICAV	positive	0.32%	-0.20%	0.52%	4.90%
	none	0.30%	-0.23%	0.53%	4.73%
France FCP	positive	0.21%	-0.21%	0.42%	4.77%
	none	0.10%	-0.27%	0.37%	5.05%
Netherlands	positive	0.56%	0.02%	0.54%	5.35%
	none	0.25%	-0.14%	0.39%	5.85%

On the basis of table 7, we are able to draw conclusions with respect to impact of sustainability on performance. This table reveals that for the funds with a positive exposure to sustainable indices the average return is slightly higher than for the

funds with no exposure. This is due to the fact that the alpha's for the subsamples with positive exposure to sustainable indices is higher than for the funds with no exposure. An additional reason is the higher average return from the style benchmark for the funds with a positive exposure, although the French SICAV funds are an exception here. Furthermore, funds with exposure have lower risk than funds without exposure to the sustainable indices. As a consequence, it seems fair to conclude that an exposure to one or both of the DJSG indices has a considerable impact on total performance.

V. CONCLUSION

Social Responsible Investing (SRI) increasingly is becoming more of an issue in portfolio management. In the US, already more than 10% of all funds is being managed on a SRI-basis. In this respect, Europe clearly lags as at most 2% of all funds is formally managed on the basis of SRI-criteria in this region. We analyze how SRI determines the return on investor portfolios in Europe. That is, we analyze the exposure to sustainability indexes of fund managers in Europe. On the basis of our style analysis for 784 funds during 1994-1999, it can be concluded that the average exposure to DJSG indices by the mutual funds is approximately 5%. This indicates that the actual investment behavior is more focussed on SRI criteria than might be expected from the actual number of funds with a formal mission statement in that direction. Therefore, it is to be expected that SRI will

become more of an issue in Europe too. Our research shows that sustainable funds have on average a higher return due to better stock selection ability and to a higher reward for systematic risk. As such, the exposure to SRI substantially affects performance. Furthermore, on a comparative basis, we find that there are clear differences between the three Euronext markets we investigated. SRI hardly is an issue in most French mutual funds. In contrast, it appears to be of significant importance in one third of the Dutch mutual funds. In all, we find that style analysis is useful in assessing the performance of SRI with mutual funds as it results in information that was previously not available. Further research is to be directed at including other markets in the comparison and at elaborating on the model, the data and the distinctive characteristics of SRI.

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APPENDIX A:

THE OUTCOMES OF THE ANALYSIS BASED ON UNCONSTRAINED REGRESSION

In this appendix, we summarize the percentage of funds with positive coefficients for the sustainable styles (95% level of confidence) in an unconstrained regression. Table A.1 clearly shows that Dutch and Belgium mutual funds use sustainable style more frequently than their French competitors. Furthermore, Dutch funds use the European sustainable style more frequently than Belgian funds, whereas Belgian funds use the US style more frequently. Table A.2 gives the percentage of funds with significant positive coefficients for the sustainable styles (95% level of confidence). Again, we find the remarkable differences between Belgium, France, and the Netherlands that are in line with our other estimations.

Table A.1: Percentage of funds with positive coefficients for sustainable indices in unconstrained regression

	Unconstrained	
	Europe	US
All funds	32.7%	33.4%
Belgium	33.6%	66.4%
France SICAV	34.8%	27.4%
France FCP	14.9%	23.5%
Netherlands	78.8%	45.0%

Table A.2: Percentage of funds with *significant* positive coefficients for sustainable indices in unconstrained regression

	Unconstrained	
	Europe	US
All funds	1.28%	0.77%
Belgium	2.73%	2.73%
France SICAV	0.59%	0.29%
France FCP	0.00%	0.39%
Netherlands	6.25%	1.25%

Significant means the percentage of funds with a confidence level of 95% of higher.

APPENDIX B:

QUANTILE-QUANTILE PLOTS

Figure B.1: QQ plot of DJSGI Europe vs. MSCI Europe

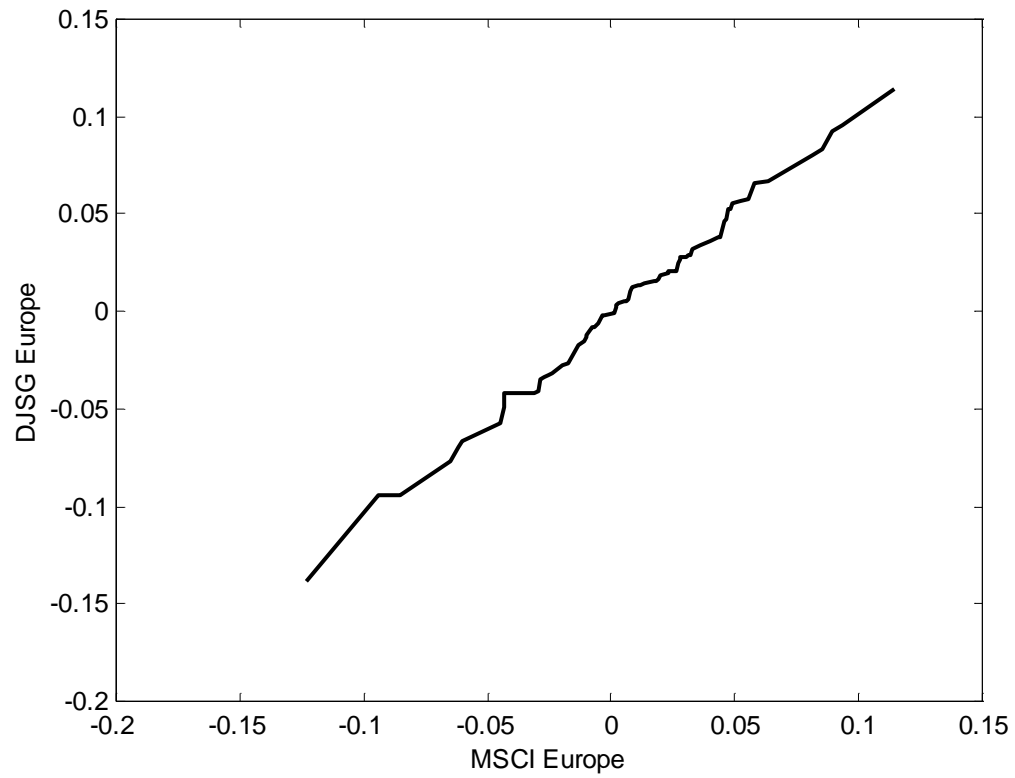


Figure B.2: QQ plot of DJSGI Americas vs. MSCI North America

